

TRANSLATION

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 0000055153	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/EP2004/014071	International filing date (<i>day/month/year</i>) 10.12.2004	Priority date (<i>day/month/year</i>) 12.12.2003	
International Patent Classification (IPC) or national classification and IPC C08J9/16, C08J9/14			
Applicant BASF AKTIENGESELLSCHAFT			

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of 2 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>																								
<p>4. This report contains indications relating to the following items:</p> <table> <tbody> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </tbody> </table>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

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Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

international search (Rule 12.3 and 23.1(b))
 publication of the international application (Rule 12.4)
 international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

the international application as originally filed/furnished
 the description:
 pages 1-9 _____ as originally filed/furnished
 pages* _____ received by this Authority on _____
 pages* _____ received by this Authority on _____
 the claims:
 nos. 6, 7 _____ as originally filed/furnished
 nos.* _____ as amended (together with any statement) under Article 19
13.10.2005 with letter
 nos.* 1-5 _____ received by this Authority on of 11.10.2005
 nos.* _____ received by this Authority on _____
 the drawings:
 sheets _____ as originally filed/furnished
 sheets* _____ received by this Authority on _____
 sheets* _____ received by this Authority on _____
 a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. The amendments have resulted in the cancellation of:

the description, pages _____
 the claims, nos. _____
 the drawings, sheets/figs _____
 the sequence listing (*specify*): _____
 any table(s) related to sequence listing (*specify*): _____
4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages _____
 the claims, nos. _____
 the drawings, sheets/figs _____
 the sequence listing (*specify*): _____
 any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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1. Statement

Novelty (N)	Claims	1 – 5	YES
	Claims		NO
Inventive step (IS)	Claims	1 – 5	YES
	Claims		NO
Industrial applicability (IA)	Claims	1 – 5	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

1 This report makes reference to the following documents:

D1: PATENT ABSTRACTS OF JAPAN vol. 2002, no. 12, 12 December 2002 & JP 2002 226622 A (HITACHI CHEM CO LTD), 14 August 2002

D2: EP-A-0 915 126 (BASF AKTIENGESELLSCHAFT) 12 May 1999

D4: US 2003/162852 A1 (CHAUDHARY BHARAT I ET AL) 28 August 2003

2 D1 describes expandable particles based on acrylonitrile-styrene copolymers with different molecular weights.

However, D1 does not appear to describe either a mixture of styrene copolymers and standard polystyrene or the weight average molecular weights claimed in the present main claims.

The subject matter of the present main claims 1, 4 and 5 therefore appears to be novel over D1 (PCT Article 33(2)).

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3 D2 (claim 1; paragraphs [0018], [0019]) discloses expandable styrene particles based on styrene polymers with bimodal molecular weight distribution.

D2 describes, as a starting compound, a mixture of styrene and possibly an additional comonomer, said mixture being initiated by two different peroxides. A mixture of styrene polymers having different chemical compositions, as claimed in the present claims, cannot be obtained by means of such a method.

The subject matter of the present main claims 1, 4 and 5 is therefore novel over D2 (PCT Article 33(2)).

4 D4 (claims 1, 2; paragraphs [0096]–[0103]) describes a method of producing expandable styrene polymer granules, said method having the following steps:

a) producing a molten mixture of i) optionally smaller amounts of a styrene homopolymer or copolymer having a molecular weight of 2,000 to 50,000 g/mol, ii) a styrene homopolymer or copolymer having a weight average molecular weight of 100,000 to 500,000 g/mol, and iii) a styrene-containing interpolymer;

b) mixing in an organic blowing agent at a higher

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temperature, and

c) cooling the expandable mixture, extruding through the die plate and pelletizing the extruded strand.

In order to arrive at the subject matter of the present claims 1, 4 and 5, a person skilled in the art would, however, have to select polymer i) as styrene copolymer and polymer ii) as standard polystyrene. Weight ratios as specified in the present claims are also not suggested by D4.

The subject matter of claims 1, 4 and 5 therefore appears to be novel over D4 (PCT Article 33(2)).

5 D4 is considered to be the closest prior art.

The distinguishing feature of the present claims 1 and 4 is considered to be the chemical composition and the weight distribution of the styrene polymers.

Since a technical effect of the present application in relation to D1 is not discernible, the objective problem to be solved is considered to be that of providing other expandable styrene polymer granules.

D4 explicitly describes exclusively mixtures of 50–60% by weight of a polystyrene homopolymer and 40–50% by weight of a polystyrene interpolymers

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with an undefined molecular weight. Weight ratios as claimed in the present claims are used only in comparative example 3.

None of the other prior art documents, either alone or in combination with the teaching of another document, even remotely anticipates the use of bimodal polystyrene mixtures as proposed in the present main claims.

The subject matter of main claims 1, 4 and 5 therefore involves an inventive step within the meaning of PCT Article 33(3).